CLAIMS

We claim:

1. An ophthalmic element comprising an at least partial coating adapted to polarize at least transmitted radiation on at least a portion of at least one exterior surface of the ophthalmic element.

2. The ophthalmic element of claim 1 wherein the ophthalmic element is chosen from corrective lenses, non-corrective lenses, and magnifying lenses.

3. The ophthalmic element of claim 1 wherein the ophthalmic element is chosen from untinted ophthalmic elements, tinted ophthalmic elements, photochromic ophthalmic elements, and tinted-photochromic ophthalmic elements.

4. The ophthalmic element of claim 1 wherein the at least partial coating adapted to polarize at least transmitted radiation is adapted to polarize at least transmitted visible radiation.

5. The ophthalmic element of claim 1 wherein the at least partial coating adapted to polarize at least transmitted radiation is adapted to polarize transmitted visible radiation and transmitted ultraviolet radiation.

6. The ophthalmic element of claim 1 wherein the at least partial coating adapted to polarize at least transmitted radiation comprises at least one dichroic material.

7. The ophthalmic element of claim 6 wherein the at least one dichroic material has an absorption ratio ranging from 2 to 30.

8. The ophthalmic element of claim 6 wherein the at least one dichroic material has an absorption ratio of at least 3.

9. The ophthalmic element of claim 6 wherein the at least one dichroic material has an absorption ratio of at least 5.

10. The ophthalmic element of claim 6 wherein the at least one dichroic material has an absorption ratio of at least 7.

11. The ophthalmic element of claim 6 wherein the at least one dichroic material has an absorption ratio of at least 10.

12. The ophthalmic element of claim 6 wherein the at least one dichroic material is chosen from azomethines, indigoids, thioindigoids, merocyanines, indans, quinophthalonic dyes, perylenes, phthaloperines, triphenodioxazines, indoloquinoxalines, imidazo-triazines, tetrazines, azo and (poly)azo dyes, benzoquinones, naphthoquinones, anthraquinone and (poly)anthraquinones, anthrapyrimidinones, iodine and iodates.

13. The ophthalmic element of claim 6 wherein the at least one dichroic material is chosen from azo and (poly)azo dyes, and anthraquinone and (poly)anthraquinones.

14. The ophthalmic element of claim 6 wherein the at least one dichroic material is a polymerizable dichroic material.

15. The ophthalmic element of claim 1 wherein the at least partial coating adapted to polarize at least transmitted radiation comprises a first dichroic material having a first absorption ratio and at least one second dichroic material having a second absorption ratio that is different than the first absorption ratio.

16. The ophthalmic element of claim 1 wherein the at least partial coating adapted to polarize at least transmitted radiation comprises at least one dichroic material and an anisotropic material.

17. The ophthalmic element of claim 16 wherein the anisotropic material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers and liquid crystal monomers.

18. The ophthalmic element of claim 17 wherein the liquid crystal material is a cross-linkable liquid crystal material.

19. The ophthalmic element of claim 18 wherein the liquid crystal material is a photocross-linkable liquid crystal material.

20. The ophthalmic element of claim 16 wherein the anisotropic material is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

21. The ophthalmic element of claim 16 wherein at least a portion of the anisotropic material is at least partially ordered in a general direction and at least a portion of the at least one dichroic material is at least partially aligned with at least a portion of the at least partially ordered anisotropic material.

22. The ophthalmic element of claim 21 wherein at least a portion of the at least one dichroic material is at least partially aligned such that the long axis of the at least a portion of the at least one dichroic material is generally parallel to the general direction of the at least partially ordered anisotropic material.

23. The ophthalmic element of claim 21 wherein the at least a portion of the at least one dichroic material that is at least partially aligned is bound to the anisotropic material.

24. The ophthalmic element of claim 16 wherein the at least partial coating adapted to polarize radiation further comprises at least one photochromic material.

25. The ophthalmic element of claim 24 wherein the at least one photochromic material is chosen from pyrans, oxazines, fulgides and fulgimides, and metal dithizonates.

26. The ophthalmic element of claim 24 wherein the at least one photochromic material is a metal oxide encapsulated photochromic material.

27. The ophthalmic element of claim 16 wherein the at least partial coating adapted to polarize radiation further comprises a mixture of photochromic materials.

28. The ophthalmic element of claim 16 wherein the at least partial coating adapted to polarize at least transmitted radiation further comprises at least one additive chosen from dyes, alignment promoters, kinetic enhancing additives, photoinitiators, solvents, light stabilizers, heat stabilizers, mold release agents, rheology control agents, leveling agents, free radical scavengers, and adhesion promoters.

29. The optical element of claim 1 wherein the at least partial coating comprises an at least partially ordered liquid crystal material and at least one at least partially aligned dichroic material.

30. The ophthalmic element of claim 1 further comprising at least one at least partial primer coating between at least a portion of the at least a partial coating adapted to polarize at least transmitted radiation and at least a portion of the at least one exterior surface of the ophthalmic element.

31. The ophthalmic element of claim 1 further comprising at least one additional at least partial coating chosen from

photochromic coatings, anti-reflective coatings, transitional coatings, primer coatings, and protective coatings on at least a portion of the ophthalmic element.

32. The ophthalmic element of claim 31 wherein the at least one additional at least partial coating is on at least a portion of the at least partial coating adapted to polarize radiation.

33. The ophthalmic element of claim 31 wherein the at least partial coating adapted to polarize radiation is on at least a portion of a first exterior surface of the ophthalmic element, and the at least one additional at least partial coating is on at least a portion of a second exterior surface of the ophthalmic element, wherein the first exterior surface of the ophthalmic element is opposite the second exterior surface of the ophthalmic element.

34. An ophthalmic element comprising:

at least one orientation facility on at least a portion of at least one exterior surface of the ophthalmic element; and

an at least partial coating adapted to polarize at least transmitted radiation on at least a portion of the at least one orientation facility.

35. The ophthalmic element of claim 34 wherein the at least one orientation facility comprises a first ordered region having a first arrangement and at least one second ordered region adjacent the first ordered region, the at least one second ordered region having an second arrangement that is different from the first arrangement.

36. The ophthalmic element of claim 34 wherein the at least one orientation facility comprises at least one of an at least partial coating comprising an at least partially ordered alignment medium, an at least partially stretched polymer sheet, and an at least partially treated surface.

37. The ophthalmic element of claim 34 wherein the orientation facility comprises a plurality of at least partial coatings comprising an at least partially ordered alignment medium.

38. The ophthalmic element of claim 34 wherein the at least one orientation facility comprises at least one at least partial coating comprising an at least partially ordered alignment medium chosen from photo-orientation materials, rubbed-orientation materials, and liquid crystal materials.

39. The ophthalmic element of claim 38 wherein the alignment medium is a liquid crystal material is chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

40. The ophthalmic element of claim 39 wherein the liquid crystal material is a cross-linkable liquid crystal material.

41. The ophthalmic element of claim 40 wherein the liquid crystal material is a photocross-linkable liquid crystal material.

42. The ophthalmic element of claim 38 wherein the alignment medium is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

43. The ophthalmic element of claim 38 wherein the alignment medium is a photo-orientation material.

44. The ophthalmic element of claim 43 wherein the photo-orientation material is a photo-orientable polymer network chosen from azobenzene derivatives, cinnamic acid derivatives, coumarine derivatives, ferulic acid derivatives, and polyimides.

45. The ophthalmic element of claim 38 wherein the at alignment medium is a rubbed-orientation material.

46. The ophthalmic element of claim 45 wherein the rubbed-orientation material is chosen from (poly)imides, (poly)siloxanes, (poly)acrylates, and (poly)coumarines.

47. The ophthalmic element of claim 34 wherein the at least one orientation facility comprises an at least partially stretched sheet of polyvinyl alcohol.

48. The ophthalmic element of claim 34 wherein the at least partially treated surface is chosen from at least partially rubbed surfaces and at least partially etched surfaces.

49. The ophthalmic element of claim 34 wherein the at least partial coating adapted to polarize at least transmitted radiation is adapted to polarize at least transmitted visible radiation.

50. The ophthalmic element of claim 34 wherein the at least partial coating adapted to polarize at least transmitted radiation comprises at least one dichroic material.

51. The ophthalmic element of claim 50 wherein the at least one dichroic material has an absorption ratio of at least 3.

52. The ophthalmic element of claim 50 wherein the at least one dichroic material has an absorption ratio of at least 5.

53. The ophthalmic element of claim 50 wherein the at least one dichroic material has an absorption ratio of at least 7.

54. The ophthalmic element of claim 50 wherein the at least one dichroic material has an absorption ratio of at least 10.

55. The ophthalmic element of claim 50 wherein the at least one dichroic material is chosen from azomethines, indigoids, thioindigoids, merocyanines, indans, quinophthalonic dyes, perylenes, phthaloperines, triphenodioxazines, indoloquinoxalines, imidazo-triazines, tetrazines, azo and (poly)azo dyes, benzoquinones, naphthoquinones, anthraquinone and (poly)anthraquinones, anthrapyrimidinones, iodine and iodates.

56. The ophthalmic element of claim 50 wherein the at least one dichroic material is a polymerizable dichroic material.

57. The ophthalmic element of claim 50 wherein the at least one orientation facility has at least one ordered region having a general direction and at least a portion of the at least one dichroic material is at least partially aligned such that the long axis of the at least a portion of the at least one the dichroic material is generally parallel to the general direction of the at least one ordered region of the orientation facility.

58. The ophthalmic element of claim 50 wherein the at least partial coating adapted to polarize at least transmitted radiation further comprises at least one anisotropic material.

59. The ophthalmic element of claim 58 wherein the anisotropic material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

60. The ophthalmic element of claim 59 wherein the liquid crystal material is a cross-linkable liquid crystal material.

61. The ophthalmic element of claim 60 wherein the liquid crystal material is a photocross-linkable liquid crystal material.

62. The ophthalmic element of claim 58 wherein the anisotropic material is a liquid crystal material having at least one

functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

63. The ophthalmic element of claim 34 further comprising at least one at least partial coating comprising an alignment transfer material between at least a portion of the orientation facility and at least a portion of the at least partial coating adapted to polarize at least transmitted radiation.

64. The ophthalmic element of claim 63 wherein the ophthalmic element comprises a plurality of at least partial coatings comprising an alignment transfer material between at least a portion of the orientation facility and at least a portion of the at least partial coating adapted to polarize at least transmitted radiation.

65. The ophthalmic element of claim 63 wherein the alignment transfer material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

66. The ophthalmic element of claim 65 wherein the liquid crystal material is a cross-linkable liquid crystal material.

67. The ophthalmic element of claim 66 wherein the liquid crystal material is a photocross-linkable liquid crystal material.

68. The ophthalmic element of claim 63 wherein the alignment transfer material is a the liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

69. The ophthalmic element of claim 34 wherein the at least partial coating adapted to polarize at least transmitted radiation further comprises at least one photochromic material.

70. The ophthalmic element of claim 69 wherein the at least one photochromic material is chosen from pyrans, oxazines, fulgides and fulgimides, and metal dithizonates.

71. The ophthalmic element of claim 34 wherein the at least partial coating adapted to polarize at least transmitted radiation further comprises at least one additive chosen from dyes, alignment promoters, kinetic enhancing additives, photoinitiators, solvents, light stabilizers, heat stabilizers, mold release agents, rheology control agents, leveling agents, free radical scavengers, and adhesion promoters.

72. The ophthalmic element of claim 34 further comprising at least one at least partially primer coating positioned between the at least one orientation facility and the at least a portion of the at least one exterior surface of the ophthalmic element.

73. The ophthalmic element of claim 34 further comprising at least one additional at least partial coating chosen from photochromic coatings, anti-reflective coatings, transitional coatings, primer coatings, and protective coatings on at least a portion of the ophthalmic element.

74. The ophthalmic element of claim 73 wherein the at least one additional at least partial coating is on at least a portion of the at least partial coating adapted to polarize at least transmitted radiation.

75. The ophthalmic element of claim 73 wherein the at least partial coating adapted to polarize at least transmitted radiation is on at least a portion of a first exterior surface of the ophthalmic element, and the at least one additional at least partial coating is on at least a portion of a second exterior

surface of the ophthalmic element, wherein the first exterior surface of the ophthalmic element is opposite the second exterior surface of the ophthalmic element.

76. An ophthalmic element comprising:

at least one at least partial coating comprising an alignment medium on at least a portion of at least one exterior surface of the ophthalmic element;

at least one at least partial coating comprising an alignment transfer material on at least a portion of the at least one at least partial coating comprising the alignment medium; and

at least one at least partial coating comprising an anisotropic material and at least one dichroic material on at least a portion of the at least one at least partial coating comprising the alignment transfer material.

77. The ophthalmic element of claim 76 wherein at least a portion of the alignment medium is at least partially ordered in a first general direction, at least a portion of the alignment transfer material is at least partially aligned in a second general direction that is generally parallel to the first general direction, at least a portion of the anisotropic material is at least partially aligned in a third general direction that is generally parallel to the second general direction, and at least a portion of the at least one dichroic material is at least partially aligned with at least a portion of the anisotropic material such that a long axis of the at least a portion of the at least one dichroic material is generally parallel to the third general direction of the at least partially aligned anisotropic material.

78. The ophthalmic element of claim 76 wherein the alignment medium is chosen from photo-orientation materials, rubbed-orientation materials, and liquid crystal materials.

79. The ophthalmic element of claim 78 wherein the liquid crystal material is chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

80. The ophthalmic element of claim 78 wherein the photo-orientation material is a photo-orientable polymer network chosen from azobenzene derivatives, cinnamic acid derivatives, coumarine derivatives, ferulic acid derivatives, and polyimides.

81. The ophthalmic element of claim 78 wherein the rubbed-orientation material is chosen from (poly)imides, (poly)siloxanes, (poly)acrylates, and (poly)coumarines.

82. The ophthalmic element of claim 76 wherein at least one at least partial coating comprising the alignment medium has a thickness ranging from of at least 2 nanometers to 10,000 nanometers.

83. The ophthalmic element of claim 76 wherein at least one at least partial coating comprising the alignment medium has a thickness ranging from of at least 5 nanometers to 1000 nanometers.

84. The ophthalmic element of claim 76 wherein at least one at least partial coating comprising the alignment medium has a thickness ranging from of at least 10 nanometers to 100 nanometers.

85. The ophthalmic element of claim 76 wherein at least one at least partial coating comprising the alignment medium has a thickness ranging from of at least 50 nanometers to 100 nanometers.

86. The ophthalmic element of claim 76 wherein the ophthalmic element comprises a plurality of at least partial coatings comprising an alignment medium.

87. The ophthalmic element of claim 76 wherein the at least one at least partial coating comprising the alignment medium further comprises at least one of a dichroic material, a photochromic material, and an additive chosen from dyes, alignment promoters, kinetic enhancing additives, photoinitiators, solvents, light stabilizers, heat stabilizers, mold release agents, rheology control agents, leveling agents, free radical scavengers, and adhesion promoters.

88. The ophthalmic element of claim 76 wherein the alignment transfer material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

89. The ophthalmic element of claim 88 wherein the liquid crystal material is a cross-linkable liquid crystal material.

90. The ophthalmic element of claim 89 wherein the liquid crystal material is a photocross-linkable liquid crystal material.

91. The ophthalmic element of claim 76 wherein the alignment transfer material is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

92. The ophthalmic element of claim 76 wherein at least one at least partial coatings comprising the alignment transfer material has an average thickness ranging from 0.5 microns to 25 microns.

93. The ophthalmic element of claim 76 wherein at least one at least partial coatings comprising the alignment transfer material has an average thickness ranging from 5 microns to 10 microns.

94. The ophthalmic element of claim 76 wherein the ophthalmic element comprises a plurality of at least partial coatings comprising an alignment transfer material.

95. The ophthalmic element of claim 76 wherein the at least one at least partial coating comprising the alignment transfer material further comprises at least one of a dichroic material, a photochromic material, and an additive chosen from dyes, alignment promoters, kinetic enhancing additives, photoinitiators, solvents, light stabilizers, heat stabilizers, mold release agents, rheology control agents, leveling agents, free radical scavengers, and adhesion promoters.

96. The ophthalmic element of claim 76 wherein at least one at least partial coating comprising the anisotropic material and at least one dichroic material has an average thickness of at least 5 microns.

97. The ophthalmic element of claim 76 wherein the ophthalmic element comprises a plurality of at least partial coatings comprising an anisotropic material and at least one dichroic material.

98. The ophthalmic element of claim 76 wherein the at least one dichroic material has an absorption ratio of at least 3.

99. The ophthalmic element of claim 76 wherein the at least one dichroic material has an absorption ratio of at least 5.

100. The ophthalmic element of claim 76 wherein the at least one dichroic material has an absorption ratio of at least 7.

101. The ophthalmic element of claim 76 wherein the at least one dichroic material has an absorption ratio of at least 10.

102. The ophthalmic element of claim 76 wherein the at least one dichroic material is chosen from azomethines, indigoids,

thioindigoids, merocyanines, indans, quinophthalonic dyes, perylenes, phthaloperines, triphenodioxazines, indoloquinoxalines, imidazo-triazines, tetrazines, azo and (poly)azo dyes, benzoquinones, naphthoquinones, anthraquinone and (poly)anthraquinones, anthrapyrimidinones, iodine and iodates.

103. The ophthalmic element of claim 76 wherein the at least one dichroic material is a polymerizable dichroic material.

104. The ophthalmic element of claim 76 wherein the anisotropic material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

105. The ophthalmic element of claim 76 wherein the anisotropic material is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

106. The ophthalmic element of claim 76 wherein the at least one at least partial coating comprising the anisotropic material and at least one dichroic material further comprises at least one photochromic material.

107. The ophthalmic element of claim 106 wherein the at least one photochromic material is chosen from pyrans, oxazines, fulgides and fulgimides, and metal dithizonates.

108. The ophthalmic element of claim 76 wherein the at least one at least partial coating comprising the anisotropic material and at least one dichroic material further comprises at least one additive chosen from dyes, alignment promoters, kinetic enhancing additives, photoinitiators, solvents, light stabilizers, heat stabilizers, mold release agents, rheology control agents, leveling agents, free radical scavengers, and adhesion promoters.

109. The ophthalmic element of claim 76 further comprising at least one at least partial primer coating between at least a portion of the at least one at least partial coating comprising an alignment medium and the at least a portion of the at least one exterior surface of the ophthalmic element.

110. The ophthalmic element of claim 76 further comprising at least one additional at least partial coating chosen from photochromic coatings, anti-reflective coatings, transitional coatings, primer coatings, and protective coatings on at least a portion of the ophthalmic element.

111. An ophthalmic element comprising:

a substrate;

at least one orientation facility comprising an at least partial coating comprising a photo-orientable polymer network on at least a portion of at least one exterior surface of the substrate; and

an at least partial coating adapted to polarize at least transmitted radiation on at least a portion of the at least one at least partial coating comprising the photo-orientable polymer network, the at least partial coating adapted to polarize at least transmitted radiation comprising a liquid crystal material and at least one dichroic dye.

112. The ophthalmic element of claim 111 further comprising at least one at least partial coating comprising at least one alignment transfer material between at least a portion of the at least partial coating adapted to polarize at least transmitted radiation and at least a portion of the at least partial coating comprising the photo-orientable polymer network.

113. An optical element comprising an at least partial coating adapted to polarize at least transmitted radiation on at least a portion of at least one exterior surface of the optical element,

the an at least partial coating comprising an at least partially ordered liquid crystal material and at least one at least partially aligned dichroic material.

114. An optical device comprising at least one optical element comprising:

an at least partial coating comprising an alignment medium on at least a portion of at least one exterior surface of the at least one optical element; and

an at least partial coating comprising an anisotropic material and at least one dichroic material on at least a portion of the at least one at least partial coating comprising the alignment medium.

115. The optical device of claim 114 wherein the at least one optical element further comprises at least one at least partial coating comprising at least one alignment transfer material between at least a portion of the at least partial coating comprising the anisotropic material and the at least one dichroic material and at least a portion of the at least partial coating comprising the alignment medium.

116. The optical device of claim 114 wherein the optical device is an ophthalmic device selected from the group consisting of eyewear, clip-on lenses, and contact lenses.

117. A method of making an ophthalmic element comprising forming an at least partial coating adapted to polarize at least transmitted radiation on at least a portion of at least one exterior surface of the ophthalmic element.

118. The method of claim 117 wherein forming the at least partial coating adapted to polarize at least transmitted radiation comprises applying an at least partial coating comprising an at least one dichroic material and at least one anisotropic material to at least a portion of at least one exterior surface of the ophthalmic element and at least partially

aligning at least a portion of the at least one dichroic material.

119. The method of claim 118 wherein applying the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material and aligning at least a portion of the at least one dichroic material occur at essentially the same time.

120. The method of claim 118 wherein applying the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material occurs prior to aligning at least a portion of the at least one dichroic material.

121. The method of claim 118 wherein applying the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material occurs after aligning at least a portion of the at least one dichroic material.

122. The method of claim 118 wherein applying the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material comprises at least one of spin coating, spray coating, spray and spin coating, curtain coating, flow coating, dip coating, injection molding, casting, roll coating, wire coating, and overlaying.

123. The method of claim 118 wherein the at least one dichroic material has an absorption ratio of at least 3.

124. The method of claim 118 wherein the at least one dichroic material has an absorption ratio of at least 5.

125. The method of claim 118 wherein the at least one dichroic material has an absorption ratio of at least 7.

126. The method of claim 118 wherein the at least one dichroic material has an absorption ratio of at least 10.

127. The method of claim 118 wherein the at least one dichroic material is chosen from azomethines, indigoids, thioindigoids, merocyanines, indans, quinophthalonic dyes, perylenes, phthaloperines, triphenodioxazines, indoloquinoxalines, imidazo-triazines, tetrazines, azo and (poly)azo dyes, benzoquinones, naphthoquinones, anthraquinone and (poly)anthraquinones, anthrapyrimidinones, iodine and iodates.

128. The method of claim 118 wherein the at least one dichroic material is a polymerizable dichroic material.

129. The method of claim 118 wherein the at least one anisotropic material is chosen from photo-orientation materials, rubbed-orientation materials, and liquid crystal materials.

130. The method of claim 118 wherein the at least one anisotropic material is a liquid crystal material chosen from liquid crystal polymers, liquid crystal pre-polymers, and liquid crystal monomers.

131. The method of claim 118 wherein the at least one anisotropic material is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

132. The method of claim 118 wherein at least partially aligning at least a portion of the at least one dichroic material comprises exposing at least a portion of the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material to at least one orientation facility.

133. The method of claim 132 wherein the at least one orientation facility is chosen from at least one of a magnetic

field, an electric field, and plane-polarized ultraviolet radiation.

134. The method of claim 118 further comprising at least partially setting at least a portion of the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material after at least partially aligning the at least one dichroic material.

135. The method of claim 134, wherein at least partially setting the at least partial coating comprising the at least one dichroic material and the at least one anisotropic material comprises at least partially cross-linking at least a portion of the at least one anisotropic material.

136. The method of claim 117 wherein forming the at least partial coating adapted to polarize at least transmitted radiation comprises:

forming a first at least partial coating comprising an alignment medium on the at least a portion of at least one exterior surface of the ophthalmic element and at least partially ordering at least a portion of the alignment medium;

forming a second at least partial coating comprising an alignment transfer material on at least a portion of the first at least partial coating and at least partially aligning at least a portion of the alignment transfer material; and

forming a third at least partial coating comprising at least one anisotropic material and at least one dichroic material on at least a portion of the second at least partial coating and at least partially aligning at least a portion of the at least one dichroic material.

137. The method of claim 136 further comprising at least partially setting at least a portion of the first at least

partial coating prior to forming the second at least partial coating.

138. The method of claim 136 further comprising at least partially setting at least a portion of the second at least partial coating after aligning at least a portion of the alignment transfer material.

139. The method of claim 136 further comprising at least partially setting at least a portion of the third at least partial coating after aligning at least a portion of the at least one dichroic material.

140. The method of claim 117 further comprising imparting at least one orientation facility on the at least a portion of the at least one exterior surface of the ophthalmic element prior to forming the at least partial coating adapted to polarize at least transmitted radiation thereon.

141. The method of claim 140 wherein imparting the at least one orientation facility on the at least a portion of the at least one exterior surface of the ophthalmic element comprises at least one of applying an at least partial coating comprising an alignment medium to the at least a portion of the at least one exterior surface of the ophthalmic element and at least partially ordering at least a portion of the alignment medium; applying an at least partially stretched polymer sheet to the at least a portion of the at least one exterior surface of the ophthalmic element; and at least partially treating at least a portion of the at least one exterior surface of the ophthalmic element.

142. A method of making an ophthalmic element comprising:

imparting at least one orientation facility comprising an at least partial coating comprising an alignment medium on at least a portion of at least one exterior surface of the ophthalmic element;

applying at least one dichroic material to at least a portion of the at least one orientation facility; and

at least partially aligning at least a portion of the at least one dichroic material.

143. The method of claim 142 wherein imparting the at least one orientation facility on the at least a portion of the at least one exterior surface of the ophthalmic element comprises applying an at least partial coating comprising an alignment medium to the at least a portion of the at least one exterior surface of the ophthalmic element and at least partially ordering at least a portion of the alignment medium.

144. The method of claim 143 wherein the alignment medium is chosen from photo-orientation materials, rubbed-orientation materials, and liquid crystal materials.

145. The method of claim 144 wherein the photo-orientation materials are photo-orientable polymer networks chosen from azobenzene derivatives, cinnamic acid derivatives, coumarine derivatives, ferulic acid derivatives, and polyimides.

146. The method of claim 144 wherein the alignment medium is a liquid crystal material having at least one functional group chosen from acrylates, methacrylates, allyl, allyl ethers, alkynes, amino, anhydrides, epoxides, hydroxides, isocyanates, blocked isocyanates, siloxanes, thiocyanates, thiols, urea, vinyl, and vinyl ethers.

147. The method of claim 146 wherein applying the at least one dichroic material to the at least a portion of the at least one orientation facility comprising the alignment medium comprises at least one of spin coating, spray coating, spray and spin coating, curtain coating, flow coating, dip coating, injection molding, casting, roll coating, wire coating, overlaying, and imbibing.

148. The method of claim 144 wherein the rubbed-orientation material is chosen from (poly)imides, (poly)siloxanes, (poly)acrylates, and (poly)coumarines.

149. The method of claim 143 wherein at least partially ordering at least a portion of the alignment medium comprises at least one of exposing the at least a portion of the alignment medium to plane-polarized ultraviolet radiation; exposing the at least a portion of the alignment medium to infrared radiation; exposing the at least a portion of the alignment medium to a magnetic field; exposing the at least a portion of the alignment medium to an electric field; drying the at least a portion of the alignment medium; etching the at least a portion of the alignment mediums; exposing the at least a portion of the alignment medium to a shear force; and rubbing the at least a portion of the alignment medium.

150. The method of claim 143 wherein imparting the at least one orientation facility on the at least a portion of the at least one exterior surface of the ophthalmic element further comprises at least partially setting at least a portion of the alignment medium by at least one of at least partially drying the at least a portion of the alignment medium, at least partially cross-linking the at least a portion of the alignment medium, and at least partially curing the at least a portion of the alignment medium.

151. The method of claim 142 wherein applying the at least one dichroic material to the at least a portion of the at least one orientation facility and at least partially aligning the at least a portion of the at least one dichroic material occur at essentially the same time.

152. The method of claim 142 wherein applying the at least one dichroic material to the at least a portion of the at least one orientation facility occurs prior to at least partially aligning the at least a portion of the at least one dichroic material.

153. The method of claim 142 wherein applying the at least one dichroic material to the at least a portion of the at least one orientation facility occurs after at least partially aligning the at least a portion of the at least one dichroic material.

154. The method of claim 142 wherein applying the at least one dichroic material to the at least a portion of the at least one orientation facility comprising the alignment medium comprises at least one of spin coating, spray coating, spray and spin coating, curtain coating, flow coating, dip coating, injection molding, casting, roll coating, wire coating, overlaying and imbibing.

155. The method of claim 142 further comprising applying an at least partial primer coating to at least a portion of the at least one exterior surface of the ophthalmic element prior to imparting at least one orientation facility to the at least a portion of the at least one exterior surface of the ophthalmic element.

156. The method of claim 142 further comprising applying to the ophthalmic element at least one an additional at least partial coating chosen from photochromic coatings, anti-reflective coatings, transitional coatings, primer coatings, and protective coatings to at least a portion of the at least one ophthalmic element.

157. A method of making an ophthalmic element comprising:

applying an at least partial coating to at least a portion of at least one exterior surface of the ophthalmic element; and

adapting at least a portion of the at least partial coating to polarize at least transmitted radiation.

158. The method of claim 157 wherein applying the at least partial coating to the at least a portion of the at least one exterior surface of the ophthalmic element and adapting the at

least a portion of the at least partial coating to polarize at least transmitted radiation occur essentially at the same time.

159. The method of claim 157 wherein applying the at least partial coating to the at least a portion of the at least one exterior surface of the ophthalmic element occurs prior to adapting the at least a portion of the at least partial coating to polarize at least transmitted radiation.

160. The method of claim 157 wherein applying the at least partial coating to the at least a portion of the at least one exterior surface of the ophthalmic element occurs after adapting the at least a portion of the at least partial coating to polarize at least transmitted radiation.

161. The method of claim 157 wherein applying the at least partial coating to the at least a portion of the at least one exterior surface of the ophthalmic element comprises applying an at least partial coating comprising at least one anisotropic material and at least one dichroic material to the at least a portion of the at least one exterior surface, and adapting at least a portion of the at least partial coating to polarize at least transmitted radiation comprises at least partially aligning at least a portion of the at least one dichroic material.

162. The method of claim 161 wherein at least partially aligning at least a portion of the at least one dichroic material comprises at least partially ordering at least a portion of the anisotropic material and at least partially aligning the at least one dichroic material with at least a portion of the at least partially ordered anisotropic material.

163. The method of claim 161 further comprising at least partially setting at least a portion of the at least partial coating comprising the at least one anisotropic material and the at least one dichroic material.

164. The method of claim 157 wherein

applying the at least partial coating to the at least a portion of at least one exterior surface of the ophthalmic element comprises applying an at least partial coating comprising an alignment medium to the at least a portion of the at least one exterior surface of the ophthalmic element; and

adapting at least a portion of the at least partial coating to polarize at least transmitted radiation comprises:

at least partially ordering at least a portion of the alignment medium,

applying at least one dichroic material to at least a portion of the at least partial coating comprising the alignment medium, and

at least partially aligning at least a portion of the at least one dichroic material.

165. The method of claim 164 wherein the alignment medium is chosen from photo-orientation materials, rubbed-orientation materials, and liquid crystal materials.

166. The method of claim 165 wherein the photo-orientation materials are photo-orientable polymer networks chosen from azobenzene derivatives, cinnamic acid derivatives, coumarine derivatives, ferulic acid derivatives, and polyimides.

167. The method of claim 164 wherein at least partially ordering the at least a portion of the alignment medium comprises at least one of exposing at least a portion of the alignment medium to plane-polarized ultraviolet radiation, exposing the at least a portion of the alignment medium to an electric field, exposing the at least a portion of the alignment medium to a magnetic field, exposing the at least a portion of the alignment medium to infrared radiation, drying the at least a portion of the alignment medium; etching the at least a portion of the alignment mediums; exposing the at least a portion of the alignment medium

to a shear force; and rubbing the at least a portion of the alignment medium.

168. The method of claim 164 further comprising at least partially setting at least a portion of the at least partial coating comprising the alignment medium prior to applying the at least one dichroic material.

169. The method of claim 164 wherein applying the at least one dichroic material and at least partially aligning at least a portion of the at least one dichroic material occur at essentially the same time.

170. The method of claim 164 wherein applying the at least one dichroic material occurs prior to at least partially aligning at least a portion of the at least one dichroic material.

171. The method of claim 164 wherein applying the at least one dichroic material occurs after at least partially aligning at least a portion of the at least one dichroic material.

172. The method of claim 164 wherein applying the at least one dichroic material to the at least a portion of the at least partial coating comprising the alignment medium comprises at least one of spin coating, spray coating, spray and spin coating, curtain coating, flow coating, dip coating, injection molding, casting, roll coating, wire coating, overlaying, and imbibing.

173. The method of claim 164 wherein applying the at least one dichroic material to the at least a portion of the at least partial coating comprising the alignment medium comprises applying an at least partial coating comprising at least one anisotropic material and the at least one dichroic material.

174. The method of claim 173 wherein at least partially aligning at least a portion of the at least one dichroic material comprises at least partially aligning at least a portion of the

at least one anisotropic material such that the at least a portion of the dichroic material is at least partially aligned with the at least partially aligned anisotropic material.

175. The method of claim 173 further comprising at least a partially setting at least a portion of the at least one anisotropic material.

176. The method of claim 157 further comprising applying an at least partial primer coating to at least a portion of the at least one exterior surface of the ophthalmic element prior to applying the at least partial coating to the at least a portion of at least one exterior surface of the ophthalmic element.

177. The method of claim 157 further comprising applying to the ophthalmic element at least one additional at least partial coating chosen from photochromic coatings, anti-reflective coatings, transitional coatings, primer coatings, and protective coatings to at least a portion of the ophthalmic element.

178. A method of making an ophthalmic element comprising:

applying an at least partial coating comprising an alignment medium to at least a portion of at least one exterior surface of the ophthalmic element;

at least partially ordering at least a portion of the alignment medium;

applying an at least partial coating comprising an anisotropic material and at least one dichroic material to at least a portion of the at least partial coating comprising the at least partially ordered alignment medium; and

at least partially aligning at least a portion of the at least one dichroic material.

179. The method of claim 178 wherein at least partially ordering at least a portion of the alignment medium comprises at least one of exposing the at least a portion of the alignment medium to

plane-polarized ultraviolet radiation, exposing the at least a portion of the alignment medium to infrared radiation, exposing the at least a portion of the alignment medium to a magnetic field, exposing the at least a portion of the alignment medium to an electric field, drying the at least a portion of the alignment medium, etching the at least a portion of the alignment medium, exposing the at least a portion of the alignment medium to a shear force, and rubbing the at least a portion of the alignment medium.

180. The method of claim 178 further comprising at least partially setting at least a portion of the at least partial coating comprising the alignment medium prior to at least partially ordering at least a portion of the alignment medium.

181. The method of claim 178 further comprising at least partially setting at least a portion of the at least partial coating comprising the alignment medium while at least partially ordering at least a portion of the alignment medium.

182. The method of claim 178 further comprising at least partially setting at least a portion of the at least partial coating comprising the alignment medium after at least partially ordering at least a portion of the alignment medium.

183. The method of claim 178 wherein at least partially aligning at least a portion of the at least one dichroic material comprises at least partially aligning at least a portion of the anisotropic material such that the at least a portion of the at least one dichroic material is at least partially aligned with the at least partially aligned anisotropic material.

184. The method of claim 178 further comprising at least partially setting at least a portion of the at least partial coating comprising the anisotropic material and the at least one partially aligned dichroic material.

185. The method of claim 184 wherein at least partially setting at least a portion of the at least partial coating comprising the anisotropic material and the at least one partially aligned dichroic material comprises at least partially curing the at least a portion of the at least partial coating by exposing the at least a portion of the at least partial coating to ultraviolet radiation under an essentially inert atmosphere.

186. The method of claim 178 further comprising applying an at least partial coating comprising an alignment transfer material to at least a portion of the at least partial coating comprising the at least partially ordered alignment medium and at least partially aligning at least a portion of the alignment transfer material prior to applying the at least partial coating comprising an anisotropic material and at least one dichroic material.

187. A method of making a lens for ophthalmic applications comprising:

applying an at least partial coating comprising a photo-orientable polymer network to at least a portion of at least one exterior surface of a lens;

at least partially ordering at least a portion of the photo-orientable polymer network with plane-polarized ultraviolet radiation;

applying an at least partial coating comprising a liquid crystal material and at least one dichroic dye to at least a portion of the at least partial coating comprising the photo-orientable polymer network;

at least partially aligning at least a portion of the at least partial coating comprising the liquid crystal material and the at least one dichroic dye; and

at least partially setting at least a portion of the coating comprising the liquid crystal material and the at least one dichroic dye.

188. The method of claim 187 further comprising at least partially setting at least a portion of the photo-orientable polymer network prior to at least partially ordering at least a portion of the photo-orientable polymer network.

189. The method of claim 187 further comprising at least partially setting at least a portion of the photo-orientable polymer network while at least partially ordering the at least a portion of the photo-orientable polymer network.

190. The method of claim 187 further comprising at least partially setting at least a portion of the photo-orientable polymer network after at least partially ordering the at least a portion of the photo-orientable polymer network.

191. The method of claim 187 further comprising applying at least one at least partial coating chosen from protective coatings and anti-reflective coatings to at least a portion the at least partial coating comprising the liquid crystal material and the at least one dichroic dye after at least partially setting at least a portion of the coating comprising the liquid crystal material and the at least one dichroic dye.

192. The method of claim 187 wherein the at least partial coating comprising a photo-orientable polymer network is applied to at least a portion of a first surface of the lens and an at least partial anti-reflective coating is applied to at least a portion of a second surface of the lens, wherein the second surface is opposite the first surface.

193. A method of making an optical element comprising:

applying an at least partial coating to at least a portion of at least one exterior surface of the optical element; and

adapting at least a portion of the at least partial coating to polarize at least transmitted radiation.

194. The method of claim 193 wherein the optical element is chosen from corrective lenses, non-corrective lenses, and magnifying lenses.